

# PATENT SPECIFICATION

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## (54) A HEADLAMP, IN PARTICULAR FOR MOTOR VEHICLES

(71) We, FORD MOTOR COMPANY LIMITED, of Eagle Way, Brentwood, Essex CM13 3BW, a British Company, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a headlamp, in particular for motor vehicles, with a sealed reflector chamber, in which the reflector is sealed off at the front by a diffuser lens and at the rear by a clear dome which projects into the interior of the chamber for receiving a bulb.

U.S. patent specification 2,423,664 describes a headlamp in which the reflector, closed off in the forward direction by a diffuser glass, consists of glass itself and is formed integrally with a dome for receiving the bulb.

U.S. patent specification 2,563,217 describes a headlamp in which the reflector, closed off in the forward direction by a diffuser glass or lens, is made of sheet metal whilst the dome which receives the bulb and projects into the interior of the reflector chamber, is made of glass and is attached to the reflector by an adhesive or the like, in a sealed fashion.

These two U.S. patent specifications of 1947 and 1951, were intended to avoid the drawback of so-called sealed-beam units, in which diffuser lens, reflector and bulb were united to form an integrated, sealed unit, that in the event of failure of the bulb, the whole unit had to be discarded. The two solutions in accordance with the two aforementioned U.S. patent specifications, overcome this drawback by retaining the advantage of a reflector chamber which is fully closed off and sealed vis-a-vis the exterior, whilst nevertheless permitting the exchange of a defective bulb.

In the double-filament bulbs nowadays generally employed in vehicle headlamps, in particular the newer Halogen double filament bulbs, the so-called "H 4" types, it is advant-

ageous to provide screening systems which prevent the exit of the rays emanating directly from the filaments themselves, in order to avoid the so-called "white wall" effect encountered otherwise in fog.

In the case of Halogen headlamps (H 4), moreover, additional screening arrangements are required which will maintain the legally prescribed illumination levels in the dipped condition, even when using normal commercially available bulbs. Again, in the case of the rectangular, flat headlamps nowadays widely used, extension of the screening is needed in order to avoid uncontrolled rays which are reflected by the horizontal surfaces and could lead to dangerous dazzling of on-coming traffic. The area of screening must be contrived in different ways in terms of size and arrangement, depending upon the headlamp shape and the bulb system.

The screening arrangements hitherto conventionally used in motor vehicle headlamps, consisted of screening caps punched out of sheet metal and attached by thin struts to the reflector. To manufacture these screening caps, relatively expensive punching tools are required and, of course, for each headlamp and each bulb system, a different set of tools was needed. Moreover, during the assembly of the known kinds of screening caps in the reflector, special care had to be taken to ensure that the thin struts were not incorrectly bent or upset since this would have adversely affected the accurate positioning and therefore the proper functioning of the caps.

According to the invention we provide a headlamp, in particular for motor vehicles, with a sealed reflector chamber, in which the reflector is sealed off at the front by a diffuser lens and at the rear by a clear dome receiving the bulb and projecting into the interior of the chamber, and a screen for the unwanted rays emanating from the filaments of the bulb is arranged upon that surface of the clear dome located in the reflector chamber, in the form of a covering.

The covering may be formed by paint

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or by a reflective coating. The reflector may be either of glass or of sheet metal, in the conventional way.

In the case of a reflector made of sheet metal, a further, smaller, clear dome may project into the interior of the reflector chamber to accommodate a parking light bulb.

A headlamp in accordance with the invention on the one hand possesses the known advantages of a headlamp with a fully closed off and sealed reflector chamber, in which the reflector is effectively protected against soiling, tarnishing and corrosion, and on the other hand ensures that a defective bulb can still be exchanged.

In addition, a headlamp in accordance with the invention has the advantage that the screening required for a specific headlamp and a specific bulb system, can be produced in a manner which is simple and cheap from the production point of view. Instead of the expensive punching tools hitherto required, all that is now needed is a covering mask which is appropriate to the particular headlamp and the bulb system to be used, and is employed when applying paint to that surface of the clear dome which is located in the reflector. The precise alignment of the screening, can here be produced with reference to the stops, required for the bulb, on the internal rim of the clear bulb. Also, the assembly of the dome in the reflector, can be effected using the same stops so that in a very simple fashion the correct angular position of bulb and screening arrangement is achieved.

The invention will now be described with reference to the accompanying drawing in which the single figure shows a side view of a headlamp in accordance with the invention, partially in section.

A headlamp in accordance with the invention consists of a diffuser lens 1, a mirrored reflector 2 and a clear dome 4 which receives the bulb 3 and projects into the interior of the reflector chamber. The clear dome is made of glass or some suitable synthetic material, and is attached in a sealed fashion, using a suitable adhesive 6, to the reflector 2 in the rearward opening 5 thereof. The clear dome may alternatively have the shape shown by the chain dotted line 4a.

The clear dome 4 is provided internally with a shoulder 7 against which the flange 8 of the bulb 3, in the present instance a Halogen twin-filament bulb, seats, the correct angular position of the bulb 3 being determined by a stop 9, on the shoulder 7.

The bulb 3 has a flange 8 which is urged against the shoulder 7 by a spring 10 which seats against a cover 13 secured by a bayonet fitting 11 to a flange 12 of the reflector 2. The cover 13 contains an opening 14 in which the connecting plug 15 for the bulb 3 is received.

A screening arrangement 16 for blocking off the unwanted rays issuing from the filaments of the bulb 3, is formed by a coloured covering which is applied to that surface of the clear dome 4 located in the reflector chamber. In the figure, the fairly complex shape of the screen 16, required by an H-4 bulb and a rectangular headlamp, is shown in dotted lines.

It will readily be appreciated that this complex screening arrangement 16 can be produced in a simple fashion by a corresponding mask through which paint is applied to the as yet unassembled clear dome 4, enabling extremely accurate arrangement of the screening 16 to be achieved.

The assembly of the clear dome 4, complete with the screening 16, in the reflector 2, can be carried out using assembly jigs which use the shoulder 7 and the stop 9 for the subsequent bulb 3, in order to hold the clear dome 4 in its correct angular position until the adhesive 6 has set sufficiently to prevent any positional change of the dome 4.

Faults, of the kind which used to occur in the known screening caps punched out of sheet metal and held in position on the reflector by thin struts, as a consequence of bending of the struts at the time of assembly, are thus avoided.

The reflector 2 consists of sheet metal. A smaller clear dome 18 receives the parking light bulb 17 and is mounted in an opening 19 in the reflector 2 and sealed off, by use of an adhesive 20.

The screening 16 for the unwanted rays coming from the filaments of the bulb 3, can alternatively be formed by a reflective coating which is applied to that surface of the clear dome 4 located in the reflector chamber.

The clear dome 4 may be assembled and secured in the still uncoated reflector 2. Thereafter, a covering mask is applied to the dome 4, which leaves exposed only the area which it is desired to cover. The reflector 2 and the screening 16 are then coated by a vapourising operation or the like, in a single operation to form a mirror finish.

This design of the screening 16 has the advantage that manufacture is still further simplified and that viewed from outside, the screening is not visible in an unsightly way.

The invention provides a headlamp, in particular for motor vehicles, which has all the advantages of a fully enclosed and sealed reflector chamber, the advantage of an easily exchangeable bulb, and the additional advantage of a simple reliable solution, from the production point of view, to the problem of screening, the latter problem being one which occurred in particular in the context of the rectangular, flattened headlamps and the new

Halogen double filament bulbs, which are nowadays so widely used.

WHAT WE CLAIM IS:—

- 5 1. A headlamp, in particular for motor vehicles, with a sealed reflector chamber, in which the reflector is sealed off at the front by a diffuser lens and at the rear by a clear dome receiving the bulb and projecting into the interior of the chamber, and a  
10 screen for the unwanted rays emanating from the filaments of the bulb is arranged upon that surface of the clear dome located in the reflector chamber, in the form of a covering.
- 15 2. A headlamp as claimed in Claim 1 in which the covering is formed by paint.
3. A headlamp as claimed in Claim 1 in which the covering is formed by a reflective layer.

4. A headlamp as claimed in any one of Claims 1 to 3 in which the reflector consists of glass with an internal reflective coating. 20

5. A headlamp as claimed in any one of Claims 1 to 3 in which the reflector consists of sheet metal.

6. A headlamp as claimed in any one of the preceding Claims in which a further, smaller, clear dome projects into the interior of the reflector chamber for receiving a bulb for a parking light. 25

7. A headlamp for a motor vehicle substantially as hereinbefore described with reference to and as shown in the accompanying drawing. 30

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

